1. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{10x^3 - 42x^2 + 37}{x - 4}$$

A. $a \in [7, 15], b \in [-89, -81], c \in [325, 333]$, and $r \in [-1276, -1272]$.

B. $a \in [7, 15], b \in [-3, 2], c \in [-8, -4]$, and $r \in [4, 9]$.

C. $a \in [7, 15], b \in [-15, -10], c \in [-38, -35]$, and $r \in [-74, -67]$.

D. $a \in [38, 46], b \in [117, 128], c \in [472, 476]$, and $r \in [1924, 1933]$.

E. $a \in [38, 46], b \in [-204, -197], c \in [808, 817]$, and $r \in [-3200, -3192]$.

---

2. What are the *possible Integer* roots of the polynomial below?

$$f(x) = 3x^4 + 6x^3 + 6x^2 + 3x + 6$$

A. $\pm 1, \pm 3$

B. $\pm 1, \pm 2, \pm 3, \pm 6$

C. All combinations of: $\dfrac{\pm 1, \pm 3}{\pm 1, \pm 2, \pm 3, \pm 6}$

D. All combinations of: $\dfrac{\pm 1, \pm 2, \pm 3, \pm 6}{\pm 1, \pm 3}$

E. There is no formula or theorem that tells us all possible Integer roots.

---

3. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{15x^3 - 33x^2 - 96x - 50}{x - 4}$$

A. $a \in [14, 16],\ b \in [24, 34],\ c \in [12, 16]$, and $r \in [-9, 0]$.

B. $a \in [57, 64],\ b \in [207, 214],\ c \in [728, 736]$, and $r \in [2878, 2879]$.

C. $a \in [14, 16],\ b \in [-97, -88],\ c \in [275, 283]$, and $r \in [-1160, -1151]$.

D. $a \in [14, 16]$, $b \in [11, 15]$, $c \in [-65, -59]$, and $r \in [-230, -226]$.

E. $a \in [57, 64]$, $b \in [-277, -269]$, $c \in [996, 1002]$, and $r \in [-4037, -4026]$.

---

4. Factor the polynomial below completely, knowing that $x + 5$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 15x^4 + 29x^3 - 233x^2 + 3x + 90$$

A. $z_1 \in [-4, 1]$, $z_2 \in [-1.52, -1.5]$, $z_3 \in [1.55, 1.68]$, and $z_4 \in [4, 8]$

B. $z_1 \in [-7, -4]$, $z_2 \in [-1.72, -1.66]$, $z_3 \in [1.46, 1.55]$, and $z_4 \in [1, 4]$

C. $z_1 \in [-7, -4]$, $z_2 \in [-0.62, -0.57]$, $z_3 \in [0.64, 0.75]$, and $z_4 \in [1, 4]$

D. $z_1 \in [-4, 1]$, $z_2 \in [-0.15, -0.04]$, $z_3 \in [2.95, 3.07]$, and $z_4 \in [4, 8]$

E. $z_1 \in [-4, 1]$, $z_2 \in [-0.67, -0.65]$, $z_3 \in [0.55, 0.64]$, and $z_4 \in [4, 8]$

---

5. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 10x^3 + 9x^2 - 28x - 12$$

A. $z_1 \in [-3.33, -2.61]$, $z_2 \in [-0.02, 0.32]$, and $z_3 \in [1.78, 2.21]$

B. $z_1 \in [-2.82, -2.12]$, $z_2 \in [-2.05, -1.75]$, and $z_3 \in [0.04, 0.93]$

C. $z_1 \in [-2.38, -1.94]$, $z_2 \in [-0.71, -0.38]$, and $z_3 \in [1.45, 1.66]$

D. $z_1 \in [-0.73, -0.52]$, $z_2 \in [1.91, 2.19]$, and $z_3 \in [2.48, 2.61]$

E. $z_1 \in [-1.57, -1.33]$, $z_2 \in [0.32, 0.59]$, and $z_3 \in [1.78, 2.21]$

---

6. Factor the polynomial below completely, knowing that $x - 5$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where

$z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 10x^4 - 99x^3 + 308x^2 - 333x + 90$$

A. $z_1 \in [-5.14, -4.51]$, $z_2 \in [-3.1, -2.9]$, $z_3 \in [-2.91, -2.29]$, and $z_4 \in [-0.78, -0.64]$

B. $z_1 \in [0.57, 0.97]$, $z_2 \in [1.9, 3.4]$, $z_3 \in [2.25, 3.29]$, and $z_4 \in [4.93, 5.07]$

C. $z_1 \in [-5.14, -4.51]$, $z_2 \in [-3.1, -2.9]$, $z_3 \in [-1.97, -1.46]$, and $z_4 \in [-0.44, -0.38]$

D. $z_1 \in [-5.14, -4.51]$, $z_2 \in [-3.1, -2.9]$, $z_3 \in [-2.01, -1.57]$, and $z_4 \in [-0.3, -0.06]$

E. $z_1 \in [0.25, 0.54]$, $z_2 \in [0.4, 2.2]$, $z_3 \in [2.25, 3.29]$, and $z_4 \in [4.93, 5.07]$

---

7. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{9x^3 + 39x^2 - 44}{x + 4}$$

A. $a \in [-39, -33], b \in [182, 186], c \in [-735, -729]$, and $r \in [2880, 2888]$.

B. $a \in [-39, -33], b \in [-106, -102], c \in [-420, -411]$, and $r \in [-1728, -1723]$.

C. $a \in [7, 16], b \in [-8, -5], c \in [28, 34]$, and $r \in [-196, -188]$.

D. $a \in [7, 16], b \in [71, 80], c \in [298, 307]$, and $r \in [1148, 1157]$.

E. $a \in [7, 16], b \in [0, 11], c \in [-14, -9]$, and $r \in [2, 10]$.

---

8. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 6x^3 - 19x^2 - 9x + 36$$

A. $z_1 \in [-1.96, -1.17]$, $z_2 \in [1.18, 1.64]$, and $z_3 \in [2, 3.4]$

B. $z_1 \in [-3.26, -2.9]$, $z_2 \in [-0.79, -0.65]$, and $z_3 \in [0.2, 0.8]$

C. $z_1 \in [-1.13, -0.74], \;\; z_2 \in [0.49, 0.98], \text{ and } z_3 \in [2, 3.4]$

D. $z_1 \in [-3.26, -2.9], \;\; z_2 \in [-0.57, -0.38], \text{ and } z_3 \in [3.7, 5]$

E. $z_1 \in [-3.26, -2.9], \;\; z_2 \in [-1.57, -1.18], \text{ and } z_3 \in [1.2, 1.4]$

---

9. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{20x^3 + 113x^2 + 142x + 42}{x + 4}$$

A. $a \in [15, 21], \;\; b \in [29, 34], \;\; c \in [9, 12], \text{ and } r \in [2, 3].$

B. $a \in [15, 21], \;\; b \in [191, 198], \;\; c \in [907, 915], \text{ and } r \in [3697, 3699].$

C. $a \in [-84, -78], \;\; b \in [-207, -203], \;\; c \in [-694, -681], \text{ and } r \in [-2708, -2700].$

D. $a \in [15, 21], \;\; b \in [10, 14], \;\; c \in [73, 85], \text{ and } r \in [-347, -336].$

E. $a \in [-84, -78], \;\; b \in [429, 434], \;\; c \in [-1591, -1588], \text{ and } r \in [6401, 6406].$

---

10. What are the *possible Integer* roots of the polynomial below?

$$f(x) = 7x^4 + 2x^3 + 4x^2 + 3x + 5$$

A. $\pm 1, \pm 5$

B. All combinations of: $\dfrac{\pm 1, \pm 5}{\pm 1, \pm 7}$

C. $\pm 1, \pm 7$

D. All combinations of: $\dfrac{\pm 1, \pm 7}{\pm 1, \pm 5}$

E. There is no formula or theorem that tells us all possible Integer roots.

---

11. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{15x^3 - 65x^2 + 82}{x - 4}$$

A. $a \in [13, 16], b \in [-24, -15], c \in [-60, -55]$, and $r \in [-99, -97]$.

B. $a \in [13, 16], b \in [-11, -1], c \in [-25, -13]$, and $r \in [-5, 4]$.

C. $a \in [60, 61], b \in [175, 181], c \in [697, 708]$, and $r \in [2882, 2889]$.

D. $a \in [13, 16], b \in [-125, -123], c \in [495, 504]$, and $r \in [-1919, -1912]$.

E. $a \in [60, 61], b \in [-309, -304], c \in [1220, 1223]$, and $r \in [-4803, -4794]$.

---

12. What are the *possible Rational* roots of the polynomial below?

$$f(x) = 6x^2 + 5x + 2$$

A. $\pm 1, \pm 2$

B. All combinations of: $\dfrac{\pm 1, \pm 2}{\pm 1, \pm 2, \pm 3, \pm 6}$

C. All combinations of: $\dfrac{\pm 1, \pm 2, \pm 3, \pm 6}{\pm 1, \pm 2}$

D. $\pm 1, \pm 2, \pm 3, \pm 6$

E. There is no formula or theorem that tells us all possible Rational roots.

---

13. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{10x^3 - 38x^2 - 16x + 34}{x - 4}$$

A. $a \in [37, 41]$, $b \in [119, 126]$, $c \in [468, 475]$, and $r \in [1922, 1924]$.

B. $a \in [5, 14]$, $b \in [-78, -74]$, $c \in [296, 303]$, and $r \in [-1152, -1147]$.

C. $a \in [5, 14]$, $b \in [-3, 4]$, $c \in [-11, -3]$, and $r \in [-1, 3]$.

D. $a \in [37, 41]$, $b \in [-201, -193]$, $c \in [776, 778]$, and $r \in [-3074, -3063]$.

E. $a \in [5, 14]$, $b \in [-10, -2]$, $c \in [-42, -39]$, and $r \in [-86, -82]$.

---

14. Factor the polynomial below completely, knowing that $x+4$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 20x^4 + 13x^3 - 253x^2 + 78x + 72$$

A. $z_1 \in [-3.3, -2.6]$, $z_2 \in [-1.16, -0.5]$, $z_3 \in [0.23, 0.44]$, and $z_4 \in [3.1, 4.6]$

B. $z_1 \in [-3.3, -2.6]$, $z_2 \in [-1.59, -1.31]$, $z_3 \in [2.3, 2.69]$, and $z_4 \in [3.1, 4.6]$

C. $z_1 \in [-4.7, -3.5]$, $z_2 \in [-2.67, -2.31]$, $z_3 \in [1.2, 1.91]$, and $z_4 \in [1.5, 3.2]$

D. $z_1 \in [-3.3, -2.6]$, $z_2 \in [-3.23, -2.61]$, $z_3 \in [-0.05, 0.12]$, and $z_4 \in [3.1, 4.6]$

E. $z_1 \in [-4.7, -3.5]$, $z_2 \in [-0.5, 0.04]$, $z_3 \in [0.72, 0.88]$, and $z_4 \in [1.5, 3.2]$

---

15. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 6x^3 - 1x^2 - 39x - 36$$

A. $z_1 \in [-0.79, -0.48]$, $z_2 \in [-0.68, -0.58]$, and $z_3 \in [2.6, 3.4]$

B. $z_1 \in [-3.4, -2.82]$, $z_2 \in [1.28, 1.47]$, and $z_3 \in [1, 1.6]$

C. $z_1 \in [-3.4, -2.82]$, $z_2 \in [0.56, 0.82]$, and $z_3 \in [-0.2, 1.1]$

D. $z_1 \in [-3.4, -2.82]$, $z_2 \in [0.36, 0.66]$, and $z_3 \in [3.4, 5.4]$

E. $z_1 \in [-2.03, -1.3]$, $z_2 \in [-1.4, -1.18]$, and $z_3 \in [2.6, 3.4]$

---

16. Factor the polynomial below completely, knowing that $x-4$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 8x^4 - 6x^3 - 189x^2 + 265x + 300$$

A. $z_1 \in [-5.9, -4.4]$, $z_2 \in [-0.82, -0.46]$, $z_3 \in [2.49, 2.51]$, and $z_4 \in [2.7, 4.9]$

B. $z_1 \in [-4.7, -2.8]$, $z_2 \in [-0.5, -0.38]$, $z_3 \in [1.33, 1.35]$, and $z_4 \in [4.7, 5.3]$

C. $z_1 \in [-5.9, -4.4]$, $z_2 \in [-4.11, -3.8]$, $z_3 \in [0.35, 0.38]$, and $z_4 \in [4.7, 5.3]$

D. $z_1 \in [-4.7, -2.8]$, $z_2 \in [-2.96, -2.39]$, $z_3 \in [0.74, 0.76]$, and $z_4 \in [4.7, 5.3]$

E. $z_1 \in [-5.9, -4.4]$, $z_2 \in [-1.42, -1.05]$, $z_3 \in [0.39, 0.41]$, and $z_4 \in [2.7, 4.9]$

---

17. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{10x^3 - 70x + 65}{x + 3}$$

A. $a \in [7, 12], b \in [30, 33], c \in [20, 26]$, and $r \in [124, 130]$.

B. $a \in [-38, -25], b \in [90, 93], c \in [-344, -335]$, and $r \in [1078, 1091]$.

C. $a \in [-38, -25], b \in [-91, -85], c \in [-344, -335]$, and $r \in [-958, -953]$.

D. $a \in [7, 12], b \in [-40, -39], c \in [89, 91]$, and $r \in [-298, -294]$.

E. $a \in [7, 12], b \in [-35, -29], c \in [20, 26]$, and $r \in [2, 13]$.

---

18. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 20x^3 - 33x^2 - 20x + 12$$

A. $z_1 \in [-2.02, -1.65]$, $z_2 \in [-2.77, -1.28]$, and $z_3 \in [0.09, 0.38]$

B. $z_1 \in [-1.2, -0.31]$, $z_2 \in [0.22, 0.44]$, and $z_3 \in [1.92, 2.22]$

C. $z_1 \in [-1.63, -1.11]$, $z_2 \in [1.83, 2.91]$, and $z_3 \in [2.28, 2.58]$

D. $z_1 \in [-2.55, -2.31]$, $z_2 \in [-2.77, -1.28]$, and $z_3 \in [1.1, 1.38]$

E. $z_1 \in [-2.02, -1.65]$, $z_2 \in [-0.52, -0.21]$, and $z_3 \in [0.69, 0.98]$

---

19. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{15x^3 + 67x^2 + 94x + 35}{x + 2}$$

A. $a \in [13, 18]$, $b \in [37, 39]$, $c \in [16, 24]$, and $r \in [-11, -3]$.

B. $a \in [-31, -28]$, $b \in [6, 13]$, $c \in [104, 113]$, and $r \in [251, 257]$.

C. $a \in [-31, -28]$, $b \in [125, 129]$, $c \in [-161, -159]$, and $r \in [354, 357]$.

D. $a \in [13, 18]$, $b \in [92, 101]$, $c \in [284, 289]$, and $r \in [606, 615]$.

E. $a \in [13, 18]$, $b \in [20, 23]$, $c \in [24, 34]$, and $r \in [-50, -46]$.

---

20. What are the *possible Integer* roots of the polynomial below?

$$f(x) = 6x^4 + 4x^3 + 7x^2 + 4x + 7$$

A. All combinations of: $\frac{\pm 1, \pm 2, \pm 3, \pm 6}{\pm 1, \pm 7}$

B. $\pm 1, \pm 7$

C. $\pm 1, \pm 2, \pm 3, \pm 6$

D. All combinations of: $\frac{\pm 1, \pm 7}{\pm 1, \pm 2, \pm 3, \pm 6}$

E. There is no formula or theorem that tells us all possible Integer roots.

---

21. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{9x^3 + 21x^2 - 7}{x + 2}$$

A. $a \in [8, 17], b \in [36, 48], c \in [77, 84]$, and $r \in [149, 151]$.

B. $a \in [8, 17], b \in [-8, -2], c \in [13, 21]$, and $r \in [-65, -60]$.

C. $a \in [-18, -14], b \in [54, 60], c \in [-114, -113]$, and $r \in [219, 224]$.

D. $a \in [8, 17], b \in [3, 8], c \in [-11, -3]$, and $r \in [4, 14]$.

E. $a \in [-18, -14], b \in [-17, -10], c \in [-32, -25]$, and $r \in [-69, -66]$.

---

22. What are the *possible Rational* roots of the polynomial below?

$$f(x) = 4x^4 + 6x^3 + 3x^2 + 7x + 2$$

A. All combinations of: $\dfrac{\pm 1, \pm 2, \pm 4}{\pm 1, \pm 2}$

B. All combinations of: $\dfrac{\pm 1, \pm 2}{\pm 1, \pm 2, \pm 4}$

C. $\pm 1, \pm 2, \pm 4$

D. $\pm 1, \pm 2$

E. There is no formula or theorem that tells us all possible Rational roots.

---

23. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{20x^3 - 48x^2 - 116x - 43}{x - 4}$$

A. $a \in [19, 24], \ b \in [12, 13], \ c \in [-85, -79]$, and $r \in [-284, -280]$.

B. $a \in [19, 24], \ b \in [-131, -125], \ c \in [391, 398]$, and $r \in [-1632, -1622]$.

C. $a \in [19, 24], \ b \in [31, 38], \ c \in [8, 19]$, and $r \in [2, 9]$.

D. $a \in [80, 86], \ b \in [-370, -364], \ c \in [1356, 1360]$, and $r \in [-5472, -5466]$.

E. $a \in [80, 86], \ b \in [269, 275], \ c \in [969, 975]$, and $r \in [3842, 3846]$.

---

24. Factor the polynomial below completely, knowing that $x+5$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 25x^4 + 210x^3 + 507x^2 + 434x + 120$$

A. $z_1 \in [1.24, 1.46]$, $z_2 \in [1.6, 1.94]$, $z_3 \in [1.3, 2.2]$, and $z_4 \in [4.71, 5.09]$

B. $z_1 \in [0.1, 0.33]$, $z_2 \in [1.89, 2.8]$, $z_3 \in [2.8, 4.5]$, and $z_4 \in [4.71, 5.09]$

C. $z_1 \in [-5.19, -4.79]$, $z_2 \in [-2.35, -1.49]$, $z_3 \in [-2, -1]$, and $z_4 \in [-1.56, -1.17]$

D. $z_1 \in [-5.19, -4.79]$, $z_2 \in [-2.35, -1.49]$, $z_3 \in [-1.1, 1.6]$, and $z_4 \in [-0.93, 0.31]$

E. $z_1 \in [0.5, 0.72]$, $z_2 \in [-0.1, 0.82]$, $z_3 \in [1.3, 2.2]$, and $z_4 \in [4.71, 5.09]$

---

25. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 6x^3 + 5x^2 - 22x - 24$$

A. $z_1 \in [-1.67, -1.39]$, $z_2 \in [-1.42, -1.18]$, and $z_3 \in [1.7, 2.6]$

B. $z_1 \in [-2.13, -1.96]$, $z_2 \in [0.46, 0.55]$, and $z_3 \in [3.7, 4.4]$

C. $z_1 \in [-2.13, -1.96]$, $z_2 \in [0.62, 0.81]$, and $z_3 \in [-0.5, 1.2]$

D. $z_1 \in [-2.13, -1.96]$, $z_2 \in [1.22, 1.4]$, and $z_3 \in [1, 1.9]$

E. $z_1 \in [-1.04, -0.67]$, $z_2 \in [-0.83, -0.6]$, and $z_3 \in [1.7, 2.6]$

---

26. Factor the polynomial below completely, knowing that $x-4$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 12x^4 - 53x^3 - 23x^2 + 202x - 120$$

A. $z_1 \in [-3.4, -1.4]$, $z_2 \in [0.68, 0.95]$, $z_3 \in [1.54, 1.71]$, and $z_4 \in [4, 6]$

B. $z_1 \in [-3.4, -1.4]$, $z_2 \in [0.52, 0.7]$, $z_3 \in [1.2, 1.38]$, and $z_4 \in [4, 6]$

C. $z_1 \in [-5.6, -4.6]$, $z_2 \in [-4.05, -3.87]$, $z_3 \in [-0.43, -0.2]$, and $z_4 \in [0, 3]$

D. $z_1 \in [-4.7, -3.1]$, $z_2 \in [-1.44, -1.16]$, $z_3 \in [-0.71, -0.32]$, and $z_4 \in [0, 3]$

E. $z_1 \in [-4.7, -3.1]$, $z_2 \in [-1.75, -1.65]$, $z_3 \in [-0.85, -0.62]$, and $z_4 \in [0, 3]$

---

27. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{8x^3 + 28x^2 - 33}{x + 3}$$

A. $a \in [5, 12], b \in [4, 6], c \in [-13, -3]$, and $r \in [0, 8]$.

B. $a \in [5, 12], b \in [52, 57], c \in [156, 158]$, and $r \in [435, 437]$.

C. $a \in [5, 12], b \in [-6, 1], c \in [13, 19]$, and $r \in [-104, -92]$.

D. $a \in [-24, -23], b \in [97, 102], c \in [-300, -290]$, and $r \in [864, 875]$.

E. $a \in [-24, -23], b \in [-48, -40], c \in [-135, -124]$, and $r \in [-432, -427]$.

---

28. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 10x^3 - 41x^2 - 54x + 45$$

A. $z_1 \in [-6, -4.8]$, $z_2 \in [-0.8, -0.3]$, and $z_3 \in [1, 1.6]$

B. $z_1 \in [-6, -4.8]$, $z_2 \in [-3.3, -2.7]$, and $z_3 \in [-0.7, 0.6]$

C. $z_1 \in [-6, -4.8]$, $z_2 \in [-2.9, -1.5]$, and $z_3 \in [0.6, 0.9]$

D. $z_1 \in [-1, -0.1]$, $z_2 \in [0.8, 2.1]$, and $z_3 \in [4.4, 5.9]$

E. $z_1 \in [-1.9, -1.1]$, $z_2 \in [-0.1, 1.2]$, and $z_3 \in [4.4, 5.9]$

29. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{12x^3 + 45x^2 - 21x - 39}{x + 4}$$

A. $a \in [8, 13]$, $b \in [90, 102]$, $c \in [342, 359]$, and $r \in [1363, 1367]$.

B. $a \in [-49, -44]$, $b \in [-152, -144]$, $c \in [-611, -607]$, and $r \in [-2475, -2471]$.

C. $a \in [-49, -44]$, $b \in [232, 242]$, $c \in [-970, -961]$, and $r \in [3834, 3839]$.

D. $a \in [8, 13]$, $b \in [-16, -10]$, $c \in [53, 55]$, and $r \in [-310, -305]$.

E. $a \in [8, 13]$, $b \in [-3, 4]$, $c \in [-19, -8]$, and $r \in [-5, 4]$.

30. What are the *possible Rational* roots of the polynomial below?

$$f(x) = 3x^2 + 6x + 5$$

A. All combinations of: $\dfrac{\pm 1, \pm 3}{\pm 1, \pm 5}$

B. All combinations of: $\dfrac{\pm 1, \pm 5}{\pm 1, \pm 3}$

C. $\pm 1, \pm 5$

D. $\pm 1, \pm 3$

E. There is no formula or theorem that tells us all possible Rational roots.